CITY OF AMMON (PWS 7100004) SOURCE WATER ASSESSMENT FINAL REPORT

October 11, 2001



State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the City of Ammon*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.

The City of Ammon drinking water system (PWS 7100004) consists of six ground water sources. The inorganic contaminants (IOCs) barium, fluoride, and arsenic have been detected at levels below the Maximum Contaminant Levels (MCLs). Levels of the IOC nitrate are consistently below 2.5 mg/L in all the wells. In 1995, the City of Ammon did not have a treatment system, yet the water has only the occasional detection of total coliform bacteria in the distribution system. One exception is March 1994, when Well #6 recorded the presence of total coliform bacterium. No synthetic organic contaminants (SOCs) or volatile organic contaminants (VOCs) have been detected in Wells #2, #6, or #8.

Each of the delineations for the six city wells encompasses slightly different corridors that extend through the city limits and to the Snake River. Therefore, each source has a different number of potential contaminant sources (between 15 and 38). The hydrologic sensitivity of the aquifer for all but Well #7 is high due to the fractured basalt, shallow ground water level, and lack of retarding layers between basalt flows. The total susceptibility score depends on the hydrologic sensitivity, which is moderate to high for all wells, the potential land use assessment, which is high for all areas, and the system construction score which varies with well log information. As such, Well #6 rates moderate for IOCs, VOCs, and SOCs. All the other wells in the system rate high for all types of contaminants.

This assessment should be used as a basis for determining appropriate new protection measures or reevaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Ammon, source water protection activities should first focus on correcting any deficiencies outlined in the Sanitary Survey. The City of Ammon should consider instituting a disinfection program, to continue to limit total coliform bacteria detections in the distribution system. Any spills from the potential contaminant sources listed in Appendix A should be carefully monitored, as should any future development in the delineation areas. Since all the water sources show a connection with the Snake River, any major contamination of the river from one-time events or floods, as in 1997, should be monitored. The City of Ammon may want to look at other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas for possible implementation. In addition, since the newer, deeper wells have a lower

potential of contamination, the City of Ammon could consider pumping more water from these wells. Construction of any new wells must conform to current regulations and should consider a depth that puts the producing zone below the sedimentary interbeds encountered between 400 and 600 feet below ground surface, thus taking advantage of the added protection these beds provide retarding the downward movement of contaminants. Even then, one must remember that open-hole well construction allows for the potential of cross-contamination between aquifer layers. Since most of the designated areas are outside the direct jurisdiction of the City of Ammon, collaboration and partnerships agreements with state and local agencies and industry groups should be established and are critical to success.

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any source water protection plan as the delineation borders a large urban area. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors through the delineations, the Department of Transportation should be involved in protection activities. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive source water assessment protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE CITY OF AMMON, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. It is important to review this information to understand what the ranking of this source means. A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Ammon public drinking water system consists of six ground water sources. The system serves approximately 6,500 people with about 1,650 connections, and is located in Bonneville County (Figure 1).

There are no current water quality issues currently facing the City of Ammon. The IOCs barium, arsenic, and fluoride are present, but at levels below the MCLs. Nitrate levels have been consistently below 2.5 mg/L in all the wells. There is the occasional detection of total coliform bacteria contamination in the distribution system and once at Well #6, but the current system still provides clean water to the public. There have been no VOC or SOC detections in the system.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Eastern Snake River Plain (ESRP) aquifer in the vicinity of the City of Ammon. The computer model used site-specific data, assimilated by WGI from a variety of sources including local area well logs, operator provided information, and hydrogeologic reports (detailed below).

The ESRP is a northeast trending basin located in southeastern Idaho. Ten thousand square miles of the basin are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lacustrine sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet in thickness and average 20 to 25 feet (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The plain is bounded on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. Rivers and streams entering the plain from the south are tributary to the Snake River. In the Idaho Falls area of the ESRP, rivers and streams entering from the north (i.e. Big and Little Lost Rivers) vanish into the highly transmissive basalts of the Snake River Plain aquifer.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet it may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center.

FIGURE 1. Geographic Location of City of Ammon STATE OF IDAHO COEUR D'ALENE 50 100 150 Miles LEWISTON BOISE AMMON IDAHO FALLS POCATELLO HO FALLS 23 WELL#8 WELL #7 WELL #6 0.6 1 Miles

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999, p. 21; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Ground water flow direction at the local scale is thought to be highly variable due to preferential flow paths through the fractured and layered basalts.

The delineated source water assessment areas for the six wells travel to the northeast and are about 20 miles long and 1 to 2 miles wide, terminating at the Snake River near Ririe. These delineations all reach the Snake River within the 3-year TOT. The delineations show that water from Snake River reachesthe city's water system within three years.

The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and the City of Ammon and from available databases.

The dominant land use outside the City of Ammon is irrigated agricultural land. Land use within the immediate area of the wells consists of urban, commercial, and industrial land uses, major transportation corridors (Highway 26 and the Union Pacific Railroad), and various irrigation canals.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the <u>potential</u> for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted from May to June of 2001. This involved identifying and documenting potential contaminant sources within the City of Ammon Source Water Assessment Areas through the use of computer databases and Geographic Information System maps developed by DEQ. In June 2001, the City of Ammon conducted an enhanced potential contaminant inventory to verify the current list and to identify additional potential sources of contamination.

Since the delineations all differ from one another, the potential contaminant sites located within each of the delineated source water areas differ. Descriptions of the sites are found in Tables A-1 through A-6 and the locations relative to the sources are depicted in Figures 2 through 7 (Appendix A). The number of potential contaminant sites ranges from about 15 (Well #5) to about 38 (Well #3). These sites include leaking underground storage tank (LUST) sites, numerous underground storage tank (UST) sites, above ground tank (AST) sites, dairies, old gas stations, auto repair shops, general contractors, businesses and industries that use chemicals, deep injection wells, recharge wells, sand and gravel pits, a landfill, and a waste water land application site. Additionally there are sites regulated under the National Pollution Discharge Elimination System (NPDES) and the Superfund Amendments and Reauthorization Act (SARA).

There are also numerous highways and the Union Pacific Railroad that cross through this transportation hub, as well as irrigation canals that cross the delineations. If an accidental spill occurred in any of these corridors, IOCs, VOCs, SOCs, or microbial contaminants could be introduced to the aquifer system.

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix B contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity was high for all but one of the wells (see Table 3). This reflects the moderate to well-drained nature of the soil, a vadose zone composed of gravel and fractured basalt, a water table less than 300 feet below land surface, and the lack of thick fine-grained layers retarding the downward movement of contaminants. Well #7 has sedimentary interbeds between the basalt flows that have a cumulative thickness of at least 50 feet. As such, Well #7 rates in the moderate category for hydrologic sensitivity because contaminants would be retarded as they infiltrate downward.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The City of Ammon drinking water system consists of six wells that extract ground water for community, commercial, recreational, and industrial uses. All the wells except Well #6 rate moderate for system construction. The 1995 Sanitary Survey found that all the wellheads and surface seals were maintained. The survey also found that all the wells were protected from surface flooding. Lack of complete well logs for the majority of the wells prevented an evaluation of the extent of and the zone that the casing and annular seal were placed. Additionally, insufficient information prevented DEQ from determining whether current well construction standards were being met. This information is summarized in Table 2. Wells #6 and #8 had complete well logs that showed where the casing and annular seals were placed. Based on the information on the well logs, Well #6 rated low for system construction.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thicknesses, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Eight-inch diameter wells require a casing thickness of 0.322-inches, ten-inch diameter wells require a casing thickness of 0.365-inches, and twelve-inch diameter wells and above require a casing thickness of 0.375-inches. Pump tests for wells producing greater than 50 gpm require a minimum of a 6-hour test. No information was available for casing thickness for Wells #2, #3, #5, and #7. Well #6 was installed with 0.250-inch thick casing. Well #8 appears to meet current well construction standards. In all other cases, though the wells may have met well construction standards at the time they were built, none of them meet the current requirements. As such, each of the wells except Well #8 was penalized with an additional point for the system construction score.

Table 1. City of Ammon Well Construction Summary Information

Well	Depth (ft)	Casing: diameter/ thickness (in)	Casing: depth (ft)/ formation	Water Table Depth (ft)	Screened Interval (ft)	Surface seal: depth (ft)/ formation	Peak pumping rate (gpm)	Drill Year
Well #2	160	12, 10, 8/NI	108/Hard black lava	56	108 – 160 open	NI	700	1952
Well #3	210	16, 12/NI	160/Clayey lava	50	160 – 210 open	NI	800	1957
Well #5	220	16, 12/NI	91/basalt broken	50	91 – 220 open	63/Broken basalt	1500	1967
Well #6	365	24, 20, 16/0.250	263/Hard basalt gray	59	263 – 365 open	263/Hard basalt gray	3000	1974
Well #7	275	30, 16/NI	63/Silt sand clay	60	63 – 275 open	63/Silt sand clay	1800	1978
Well #8	371	24, 20, 16/0.388	371/Soft gray sandstone & gravel	84	328 – 370	145/Clean reddish solid rock	4000	1996

¹ From WGI (2001) average pumping rate data

NI = no information was available

Potential Contaminant Source and Land Use

Due to numerous potential petroleum contaminant sources, much agricultural land with high county level nitrogen and total agricultural chemical usage, and numerous transportation corridors, all six wells rated high for IOCs (i.e. arsenic, nitrate), VOCs (i.e. petroleum products), and SOCs (i.e. pesticides) and moderate for microbial contaminants (i.e. bacteria). The delineations also cross an SOC priority area for the pesticide Atrazine.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. In this case, Well #6 would automatically rate high for microbial contamination because of the repeat detection in 1994. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, Well #6 rates moderate for IOCs, VOCs, and SOCs and high for microbial contamination. All the other wells rate high for all categories (see Table 3 & Appendix B).

Table 2. Summary of the City of Ammon' Susceptibility Evaluation

						tibility Scores ¹				
	Hydrologic Contaminant Sensitivity Inventory			System Construction	Fin	al Susce _l	otibility	Ranking		
Source		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #2	Н	Н	Н	Н	M	M	Н	Н	Н	Н
Well #3	Н	Н	Н	Н	M	M	Н	Н	Н	Н
Well #5	Н	Н	Н	Н	M	M	Н	Н	Н	Н
Well #6	Н	Н	Н	Н	M	L	M	M	M	H^{*2}
Well #7	M	Н	Н	Н	M	M	Н	Н	Н	Н
Well #8	Н	Н	Н	Н	M	M	Н	Н	Н	Н

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility

Susceptibility Summary

In terms of total susceptibility, all but one of the wells rates high for all categories. Well #6 casing and annular seal are installed into low permeability units, reducing the downward movement of contaminants.

Each of the well delineations had numerous potential contaminant sites and a large percentage of agricultural land uses including being located in an SOC priority area for the pesticide Atrazine. The hydrologic sensitivity was high for the majority of the wells due to the nature of the fractured basalt that allows for contaminants to penetrate deep into the system. Lack of complete information for four of the wells caused DEQ to be conservative and give the system more points when the answer was unknown.

Despite the moderate and high susceptiblity ratings for the City of Ammon, the city continues to provide high quality water to its citizens. There has never been a VOC or SOC detection in the sampled well water. The lack of a disinfection system allows for the occasional detection of total coliform bacteria in the distribution system and once at Well #6. The IOCs arsenic, barium, and fluoride are at levels below the MCL. Nitrates have consistently been less than 2.5 mg/L. Despite the high quality of water currently being provided, the City of Ammon should be aware of the possibility of future contamination from potential contaminant sources and from continued agricultural practices.

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

 $^{^{2}}$ H* = Well rated automatically high because of repeat total coliform detection in 1994

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the City of Ammon, source water protection activities should first focus on correcting any deficiencies outlined in the Sanitary Survey. The City of Ammon should consider instituting a disinfection program, to continue to limit total coliform bacteria detections in the distribution system. Any spills from the potential contaminant sources listed in Appendix A should be carefully monitored, as should any future development in the delineation areas. Since all of the water sources show a connection with the Snake River, any major contamination of the river from one time events or floods, as in 1997, should be monitored. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Since the deeper wells and the newer wells have a lower potential of contamination, the City of Ammon could consider pumping more water from these wells. Any new system well must meet the Recommended Standards for Water Works (1997) as outlined in IDAPA 37.03.09 and IDAPA 58.01.08.550 and should consider a depth that puts the producing zone below the sedimentary interbeds that are encountered between 400 and 600 feet below ground surface, thus retarding the downward movement of contaminants. Even then, one must remember that open hole well construction allows for the potential of cross-contamination between aquifer layers. Since most of the designated areas are outside the direct jurisdiction of the City of Ammon. Partnerships with state and local agencies and industry groups should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any source water protection plan as the delineation borders a large urban area. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors through the delineations, the Department of Transportation should be involved in protection activities. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office (208) 528-2650

State DEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

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Appendix A

City of Ammon Delineation Figures and Potential Contaminant Tables

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

<u>AST (Aboveground Storage Tanks)</u> – Sites with aboveground storage tanks.

<u>Business Mailing List</u> – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

<u>CERCLIS</u> – This includes sites considered for listing under the <u>Comprehensive Environmental Response Compensation and Liability Act (CERCLA)</u>. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

<u>Cyanide Site</u> – DEQ permitted and known historical sites/facilities using cyanide.

<u>Dairy</u> – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

<u>Deep Injection Well</u> – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

<u>Floodplain</u> – This is a coverage of the 100year floodplains.

<u>Group 1 Sites</u> – These are sites that show elevated levels of contaminants and are not within the priority one areas.

<u>Inorganic Priority Area</u> – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

<u>Landfill</u> – Areas of open and closed municipal and non-municipal landfills.

<u>LUST (Leaking Underground Storage Tank)</u> – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

<u>Mines and Quarries</u> – Mines and quarries permitted through the Idaho Department of Lands.

<u>Nitrate Priority Area</u> – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

<u>Organic Priority Areas</u> – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

<u>Recharge Point</u> – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

<u>Toxic Release Inventory (TRI)</u> – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

<u>UST (Underground Storage Tank)</u> – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

<u>Wastewater Land Applications Sites</u> – These are areas where the land application of municipal or industrial wastewater is permitted by DEO.

<u>Wellheads</u> – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

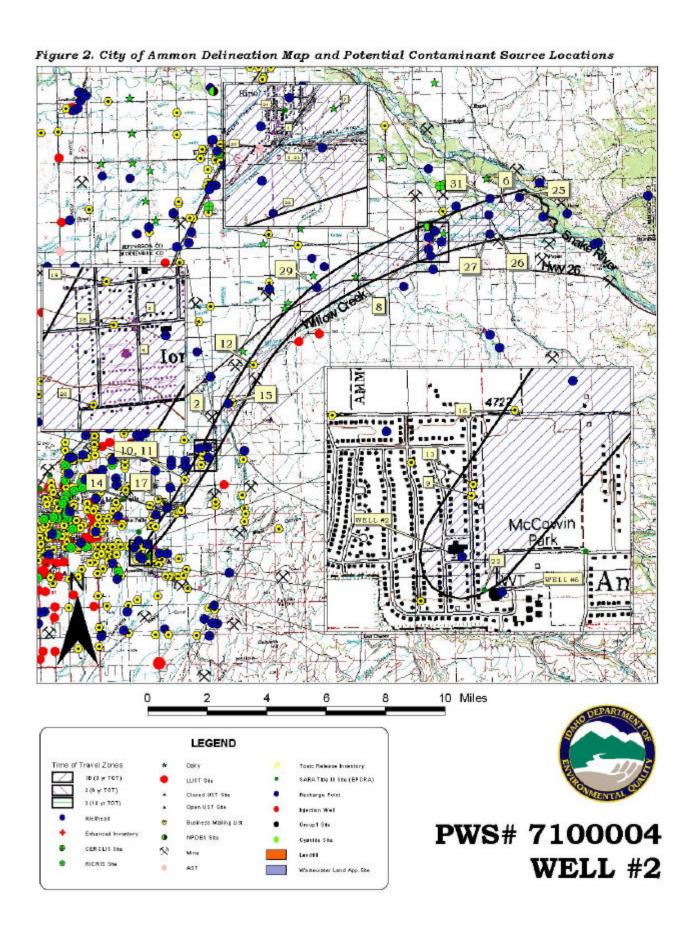


Table A-1. Well #2, Potential Contaminant Inventory

Site #	Source Description ¹	TOT ZONE ²		Potential Contaminants ³
1	UST - open	0 - 3	Database Search	VOC, SOC
2	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
3	UST - open	0 - 3	Database Search	VOC, SOC
4	UST - open	0 - 3	Database Search	VOC, SOC
5, 23	UST – open, SARA	0 - 3	Database Search	VOC, SOC
6	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
7	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
8	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
9	Boilers-Repairing & Cleaning	0 - 3	Database Search	IOC, VOC, SOC
10, 11	Trapping Equipment & Supplies, Fur Farms	0 - 3	Database Search	IOC, VOC, SOC, Microbes
12	General contractor	0 - 3	Database Search	IOC, VOC, SOC
13	Delivery Service	0 - 3	Database Search	VOC, SOC
14	Bathtubs and Sinks-Repairing	0 - 3	Database Search	IOC, VOC, SOC
15	Steel Erectors	0 - 3	Database Search	IOC, VOC
16	Photographers-Portrait	0 - 3	Database Search	IOC, VOC
17	Printers	0 - 3	Database Search	IOC, VOC
18	Grain Elevators	0 - 3	Database Search	IOC, SOC, Microbes
19	Trucking-Heavy Hauling	0 - 3	Database Search	IOC, VOC, SOC
20	General contractor	0 - 3	Database Search	IOC, VOC, SOC
21	NPDES	0 - 3	Database Search	IOC, Microbes
22	SARA	0 - 3	Database Search	IOC, VOC, SOC, Microbes
24	SARA	0 - 3	Database Search	IOC, VOC
25	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
26	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
27	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
28	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
29	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
30	AST	0 - 3	Database Search	VOC, SOC
31	WLAP site	0 - 3	Database Search	IOC, VOC, SOC, Microbes
	Highway 26	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Willow Creek	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	3 - 10	GIS Map	IOC, VOC, SOC, Microbes

¹UST = underground storage tank, NPDES = National Pollutant Discharge Elimination System, SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application, AST = above ground storage tank

TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 3. City of Ammon Delineation Map and Potential Contaminant Source Locations L LY AND GL H 10 Miles LEGEND Time of Travel Zones. Deiry Toxic Release Inventory LUST Sax SARATMO III Site (EFORA) Clayed UST 56e Beckurge Foldt. Business Mailing List PWS# 7100004 NPDER Site Cyantes Situ. CENTLIS Site Landill WELL #3 RICRIS Ste Wattewater Land App. Site

Table A-2. Well #3, Potential Contaminant Inventory

Site #	Source Description ¹	TOT ZONE ²	Source of Information	Potential Contaminants ³
1	UST - open	0 - 3	Database Search	IOC, VOC, SOC
2, 7, 18	UST - open, Gas station, Car wash	0 - 3	Database Search	VOC, SOC
3	UST - open	0 - 3	Database Search	VOC, SOC
4	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
5	UST - open	0 - 3	Database Search	VOC, SOC
6	UST - closed	0 - 3	Database Search	VOC, SOC
8	UST - open	0 - 3	Database Search	VOC, SOC
9, 30	UST - open, SARA	0 - 3	Database Search	VOC, SOC
10	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
11	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
12	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
13	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
14	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
15	Potatoes-Processed	0 - 3	Database Search	IOC, SOC, Microbes
16, 17	Trapping Equipment & Supplies, Fur Farms	0 - 3	Database Search	IOC, VOC, SOC, Microbes
19	Material Handling Equipment	0 - 3	Database Search	VOC, SOC
20	General contractor	0 - 3	Database Search	IOC, VOC, SOC
21	Home Builders	0 - 3	Database Search	IOC, VOC, SOC
22	Steel Erectors	0 - 3	Database Search	IOC, VOC
23	Grain Elevators	0 - 3	Database Search	IOC, SOC, Microbes
24	Excavating Contractors	0 - 3	Database Search	IOC, VOC, SOC
25	Painters	0 - 3	Database Search	IOC, VOC, SOC
26	Trucking-Heavy Hauling	0 - 3	Database Search	IOC, VOC, SOC
27	NPDES	0 - 3	Database Search	IOC, Microbes
28	Sand and gravel pit	0 - 3	Database Search	IOC
29	Sand and gravel pit	0 - 3	Database Search	IOC
31	SARA	0 - 3	Database Search	IOC, VOC
32	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
33	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
34	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
35	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
36	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
37	AST	0 - 3	Database Search	VOC, SOC
38	WLAP site	0 - 3	Database Search	IOC, VOC, SOC, Microbes
	Highway 26	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Willow Creek	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	3 - 10	GIS Map	IOC, VOC, SOC, Microbes

¹UST = underground storage tank, NPDES = National Pollutant Discharge Elimination System, SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application, AST = above ground storage tank

TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

TOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 4. City of Ammon Delineation Map and Potential Contaminant Source Locations 13 10 Miles LEGEND Time of Travel Zones. Deiry Toxic Release Inventory IB (7 or TOT) SARATMO III Site (EFORA) LUST See Clayed UST 580 Beckurge Foldt. Business Mailing List PWS# 7100004 NPDER Site Cyantes Situ. CENTLIS Site Landill WELL #5 RICRIS Ste Wattewater Land App. Site

Table A-3. Well #5, Potential Contaminant Inventory

Site #	Source Description ¹	TOT ZONE ²	Source of Information	Potential Contaminants ³
1	UST - open	0 - 3	Database Search	VOC, SOC
2	UST - closed	0 - 3	Database Search	VOC, SOC
3, 9	UST – open, SARA	0 - 3	Database Search	VOC, SOC
4	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
5	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
6	Steel Erectors	0 - 3	Database Search	IOC, VOC
7	Sand and gravel pit			IOC
8	Sand and gravel pit			IOC
10	SARA	0 - 3	Database Search	IOC, VOC
11	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
12	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
13	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
14	AST	0 - 3	Database Search	VOC, SOC
15	WLAP site	0 - 3	Database Search	IOC, VOC, SOC, Microbes
	Highway 26	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Willow Creek	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	3 - 10	GIS Map	IOC, VOC, SOC, Microbes

¹UST = underground storage tank, NPDES = National Pollutant Discharge Elimination System, SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application, AST = above ground storage tank

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

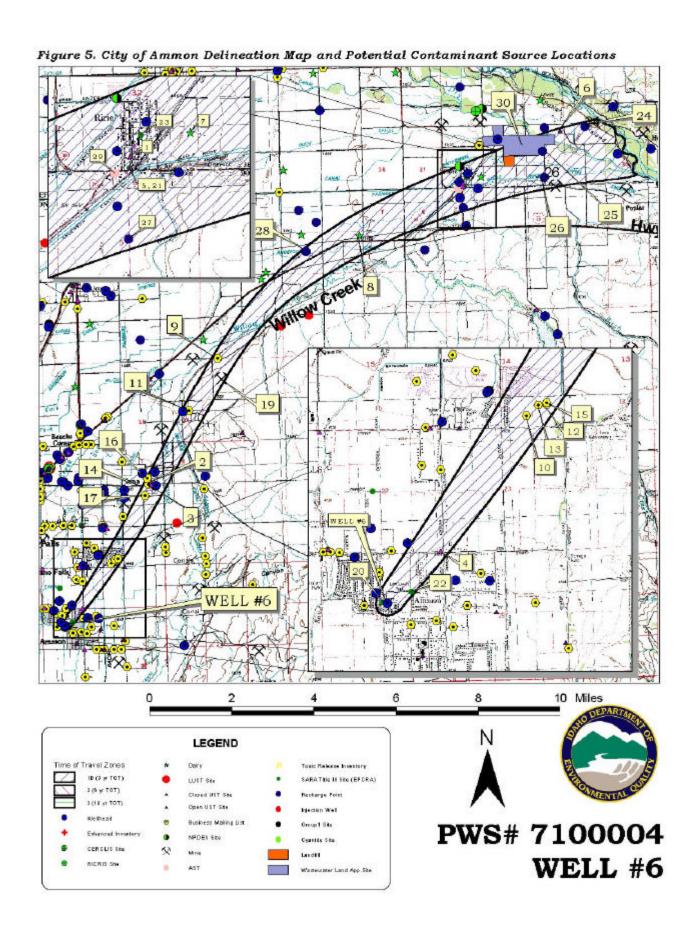


Table A-4. Well #6, Potential Contaminant Inventory

Site #	Source Description ¹	TOT ZONE ²	Source of Information	Potential Contaminants ³	
1	UST - open	0 - 3	Database Search	VOC, SOC	
2	UST - open	0 - 3	Database Search	VOC, SOC	
3	UST - open	0 - 3	Database Search	VOC, SOC	
4	UST - open	0 - 3	Database Search	VOC, SOC	
5, 21	UST – open, SARA	0 - 3	Database Search	VOC, SOC	
6	UST - closed	0 - 3	Database Search	IOC, VOC, SOC	
7	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes	
8	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes	
9	General contractor	0 - 3	Database Search	IOC, VOC, SOC	
10	Bathtubs and Sinks-Repairing	0 - 3	Database Search	IOC, VOC, SOC	
11	Steel Erectors	0 - 3	Database Search	IOC, VOC	
12	General contractor	0 - 3	Database Search	IOC, VOC	
13	Printers	0 - 3	Database Search	IOC, VOC	
14	Grain Elevators	0 - 3	Database Search	IOC, SOC, Microbes	
15	Tire-Dealers-Retail			VOC, SOC	
16	Trucking-Heavy Hauling	0 - 3	Database Search	IOC, VOC, SOC	
17	General contractor	0 - 3	Database Search	IOC, VOC, SOC	
18	NPDES	0 - 3	Database Search	IOC, Microbes	
19	Sand and gravel pit			IOC	
20	SARA	0 - 3	Database Search	IOC, VOC, SOC, Microbes	
22	SARA			IOC, Microbes	
23	SARA	0 - 3	Database Search	IOC, VOC	
24	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC	
25	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC	
26	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC	
27	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC	
28	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC	
29	AST	0 - 3	Database Search	VOC, SOC	
30	WLAP site	0 - 3	Database Search	IOC, VOC, SOC, Microbes	
	Highway 26	0 - 3	GIS Map	IOC, VOC, SOC, Microbes	
	Union Pacific Railroad	0 - 3	GIS Map	IOC, VOC, SOC, Microbes	
	Willow Creek	0 - 3	GIS Map	IOC, VOC, SOC, Microbes	
	Snake River	3 - 10	GIS Map	IOC, VOC, SOC, Microbes	

¹UST = underground storage tank, NPDES = National Pollutant Discharge Elimination System, SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application, AST = above ground storage tank

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

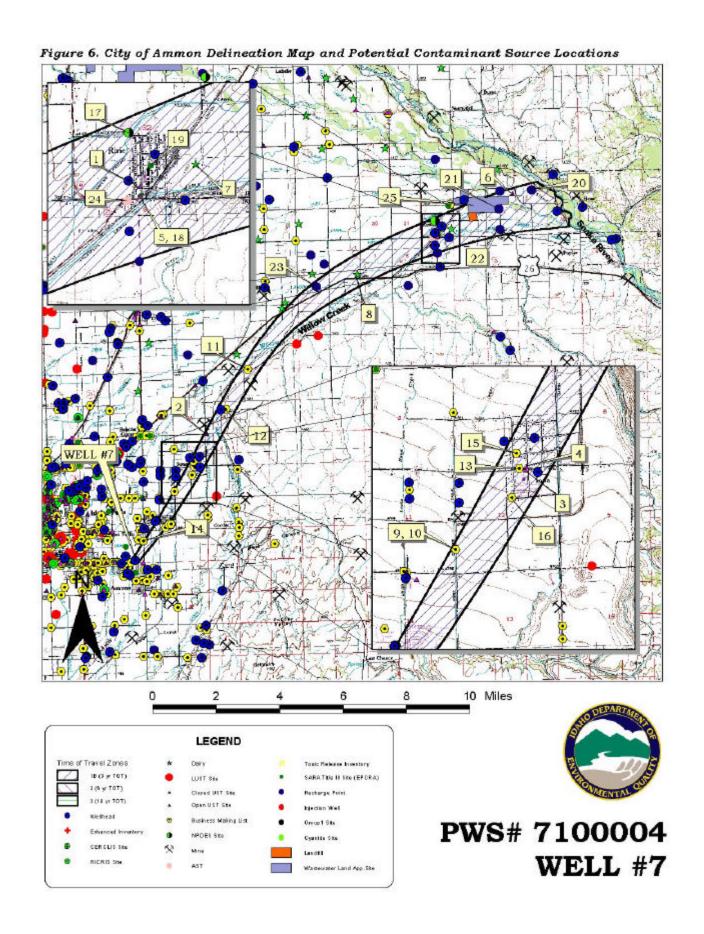


Table A-5. Well #7, Potential Contaminant Inventory

Site #	Source Description ¹	TOT ZONE ²	Source of Information	Potential Contaminants ³
1	UST - open	0 - 3	Database Search	VOC, SOC
2	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
3	UST - open	0 - 3	Database Search	VOC, SOC
4	UST - open	0 - 3	Database Search	VOC, SOC
5, 18	UST – open, SARA	0 - 3	Database Search	VOC, SOC
6	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
7	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
8	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
9, 10	Trapping Equipment & Supplies, Fur Farms	0 - 3	Database Search	IOC, VOC, SOC, Microbes
11	General contractor	0 - 3	Database Search	IOC, VOC, SOC
12	Steel Erectors	0 - 3	Database Search	IOC, VOC
13	Grain Elevators	0 - 3	Database Search	IOC, SOC, Microbes
14	Excavating Contractors			IOC, VOC, SOC
15	Trucking-Heavy Hauling	0 - 3	Database Search	VOC, SOC
16	General contractor	0 - 3	Database Search	IOC, VOC, SOC
17	NPDES	0 - 3	Database Search	IOC, Microbes
19	SARA	0 - 3	Database Search	IOC, VOC
20	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
21	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
22	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
23	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
24	AST	0 - 3	Database Search	VOC, SOC
25	WLAP site	0 - 3	Database Search	IOC, VOC, SOC, Microbes
	Highway 26	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Willow Creek	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	3 - 10	GIS Map	IOC, VOC, SOC, Microbes

¹UST = underground storage tank, NPDES = National Pollutant Discharge Elimination System, SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application, AST = above ground storage tank

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

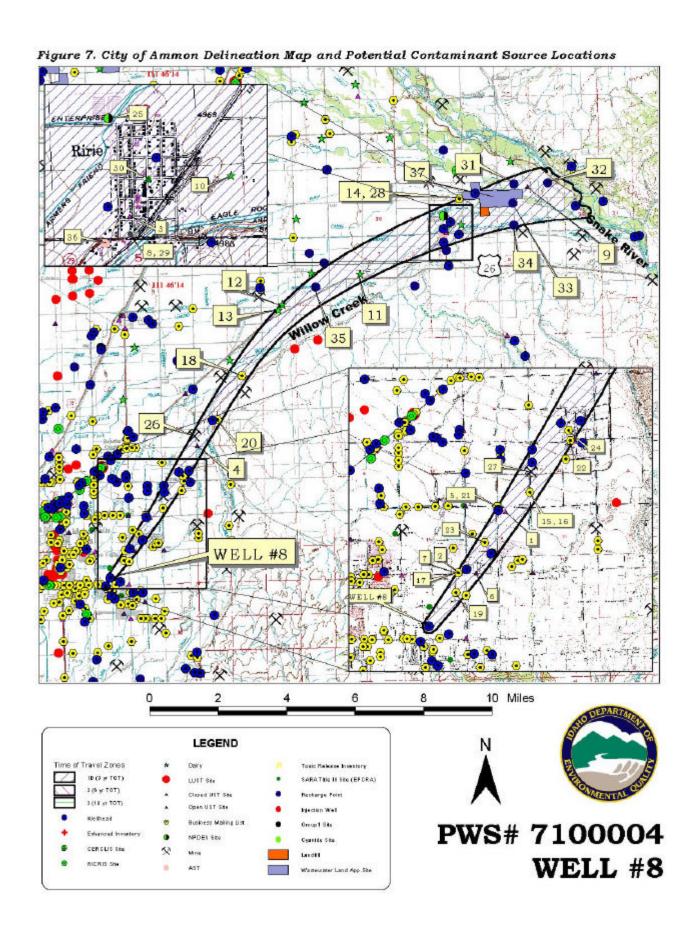


Table A-6. Well #8, Potential Contaminant Inventory

Site #	Source Description ¹	TOT ZONE ²	Source of Information	Potential Contaminants ³
1, 21	UST – open, Farms	0 - 3	Database Search	IOC, VOC, SOC, Microbes
2, 7, 17	UST - open, Gas station, Car wash	0 - 3	Database Search	VOC, SOC
3	UST - open	0 - 3	Database Search	VOC, SOC
4	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
5	UST - closed	0 - 3	Database Search	VOC, SOC
6	UST - closed	0 - 3	Database Search	VOC, SOC
8, 29	UST - open	0 - 3	Database Search	VOC, SOC
9	UST - closed	0 - 3	Database Search	IOC, VOC, SOC
10	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
11	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
12	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
13	Dairy <= 200 cows	0 - 3	Database Search	IOC, SOC, Microbes
14, 28	Potatoes-Processed, SARA	0 - 3	Database Search	IOC, SOC, Microbes
15, 16	Trapping Equipment & Supplies, Fur Farms	0 - 3	Database Search	IOC, VOC, SOC, Microbes
18	General contractor	0 - 3	Database Search	IOC, VOC, SOC
19	Home Builders	0 - 3	Database Search	IOC, VOC, SOC
20	Steel Erectors	0 - 3	Database Search	IOC, VOC
22	Grain Elevators	0 - 3	Database Search	IOC, SOC, Microbes
23	Painters	0 - 3	Database Search	IOC, VOC, SOC
24	Trucking-Heavy Hauling	0 - 3	Database Search	IOC, VOC, SOC
25	NPDES	0 - 3	Database Search	IOC, Microbes
26	Sand and gravel pit	0 - 3	Database Search	IOC
27	Sand and gravel pit	0 - 3	Database Search	IOC
30	SARA	0 - 3	Database Search	IOC, VOC
31	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
32	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
33	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
34	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
35	Recharge point - unused	0 - 3	Database Search	IOC, VOC, SOC
36	AST	0 - 3	Database Search	VOC, SOC
37	WLAP site	0 - 3	Database Search	IOC, VOC, SOC, Microbes
	Highway 26	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Union Pacific Railroad	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Willow Creek	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Snake River	3 - 10	GIS Map	IOC, VOC, SOC, Microbes

¹UST = underground storage tank, NPDES = National Pollutant Discharge Elimination System, SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application, AST = above ground storage tank

TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Appendix B

City of Ammon
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

- 0 5 Low Susceptibility
- 6 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

Public Water System Name :

Public Water System Number 7100004

1. System Construction Drill Date 08/01/1952 Driller Log Available YES Sanitary Survey (if yes, indicate date of last survey) 1995 YES Well meets IDWR construction standards NO 1 Wellhead and surface seal maintained YES Casing and annular seal extend to low permeability unit NO Highest production 100 feet below static water level Well located outside the 100 year flood plain Total System Construction Score 4 Hydrologic Sensitivity Soils are poorly to moderately drained YES Vadose zone composed of gravel, fractured rock or unknown 1 NO Depth to first water > 300 feet 1 Aquitard present with > 50 feet cumulative thickness Total Hydrologic Score 6 IOC Score Score 3. Potential Contaminant / Land Use - ZONE 1A Score Land Use Zone 1A IRRIGATED CROPLAND 2 2 2 2 2 chemical use high YES 2 0 2 Farm chemical use high YES Farm chemical use high YES 2 0 2 icrobial sources in Zone 1A NO NO NO NO NO Total Potential Contaminant Source/Land Use Score - Zone 1A 4 2 4 IOC, VOC, SOC, or Microbial sources in Zone 1A Potential Contaminant / Land Use - ZONE 1B Contaminant sources present (Number of Sources) 26 27 27 8 8 (Score = # Sources X 2) 8 Points Maximum 8 Sources of Class II or III leacheable contaminants or 7 11 YES 4 4 4 Points Maximum 4 Zone 1B contains or intercepts a Group 1 Area YES 0 0 4 0 Land use Zone 1B Greater Than 50% Irrigated Agricultural Land ._____ Total Potential Contaminant Source / Land Use Score - Zone 1B 16 16 18 12 Potential Contaminant / Land Use - ZONE II 2 2. Contaminant Sources Present 2. Sources of Class II or III leacheable contaminants or YES 1 1 1 Land Use Zone II Potential Contaminant Source / Land Use Score - Zone II 3 3 3 Potential Contaminant / Land Use - ZONE III YES 1 1 Contaminant Source Present YES 1 Sources of Class II or III leacheable contaminants or 1 1 NO 0 0 Is there irrigated agricultural lands that occupy > 50% of Total Potential Contaminant Source / Land Use Score - Zone III 2 2 2 Cumulative Potential Contaminant / Land Use Score 4. Final Susceptibility Source Score 5. Final Well Ranking High

Well# : WELL #2

06/29/2001 11:29:23 AM

Is there irrigated agricultural lands that occupy > 50% of

Cumulative Potential Contaminant / Land Use Score

4. Final Susceptibility Source Score

5. Final Well Ranking

Public Water System Name :

AMMON CITY OF

06/29/2001 11:29:36 AM Public Water System Number 7100004 1. System Construction Drill Date 01/03/1957 Driller Log Available YES Sanitary Survey (if yes, indicate date of last survey) 1995 YES Well meets IDWR construction standards NO 1 Wellhead and surface seal maintained YES Casing and annular seal extend to low permeability unit NO Highest production 100 feet below static water level Well located outside the 100 year flood plain 2. Hydrologic Sensitivity Soils are poorly to moderately drained YES Vadose zone composed of gravel, fractured rock or unknown 1 NO Depth to first water > 300 feet 1 Aquitard present with > 50 feet cumulative thickness Total Hydrologic Score 6 IOC SOC Microbial Score Score 3. Potential Contaminant / Land Use - ZONE 1A Score

 Land Use Zone 1A
 IRRIGATED CROPLAND
 2
 2
 2
 2
 2

 Farm chemical use high
 YES
 2
 0
 2

 Microbial sources in Zone 1A
 NO
 NO
 NO
 NO
 NO
 NO

 Total Potential Contaminant Source/Land Use Score - Zone 1A
 4
 2
 4
 2

 IOC, VOC, SOC, or Microbial sources in Zone 1A Potential Contaminant / Land Use - ZONE 1B Contaminant sources present (Number of Sources) 29 28 8 (Score = # Sources X 2) 8 Points Maximum 8 8 Sources of Class II or III leacheable contaminants or YES 15 13 14 4 4 4 Points Maximum 4 Zone 1B contains or intercepts a Group 1 Area YES 0 4 4 Land use Zone 1B Greater Than 50% Irrigated Agricultural Land Total Potential Contaminant Source / Land Use Score - Zone 1B 16 16 18 12 Potential Contaminant / Land Use - ZONE II Contaminant Sources Present 2 2. 2 Sources of Class II or III leacheable contaminants or YES 1 1 1 Land Use Zone II Potential Contaminant Source / Land Use Score - Zone II 3 3 3 Potential Contaminant / Land Use - ZONE III YES 1 1 Contaminant Source Present YES 1 1 Sources of Class II or III leacheable contaminants or 1

NO

Total Potential Contaminant Source / Land Use Score - Zone III 2 2 2

Well# : WELL #3

0

High

0

Public Water System Name :

AMMON CITY OF

Public Water System Number 7100004

1. System Construction Drill Date 10/30/1967 Driller Log Available YES Sanitary Survey (if yes, indicate date of last survey) 1995 YES Well meets IDWR construction standards NO 1 Wellhead and surface seal maintained YES Casing and annular seal extend to low permeability unit NO Highest production 100 feet below static water level Well located outside the 100 year flood plain Hydrologic Sensitivity Soils are poorly to moderately drained YES Vadose zone composed of gravel, fractured rock or unknown 1 NO Depth to first water > 300 feet 1 Aquitard present with > 50 feet cumulative thickness Total Hydrologic Score 6 IOC SOC Microbial Score Score 3. Potential Contaminant / Land Use - ZONE 1A Score

 Land Use Zone 1A
 IRRIGATED CROPLAND
 2
 2
 2
 2
 2

 Farm chemical use high
 YES
 2
 0
 2

 icrobial sources in Zone 1A
 NO
 NO
 NO
 NO
 NO
 NO

 Total Potential Contaminant Source/Land Use Score - Zone 1A
 4
 2
 4
 2

 IOC, VOC, SOC, or Microbial sources in Zone 1A Potential Contaminant / Land Use - ZONE 1B 13 13 Contaminant sources present (Number of Sources) 13 6 8 8 (Score = # Sources X 2) 8 Points Maximum 8 Sources of Class II or III leacheable contaminants or 6 8 YES 6 4 4 4 Points Maximum 4 Zone 1B contains or intercepts a Group 1 Area YES 0 4 4 Land use Zone 1B Greater Than 50% Irrigated Agricultural Land ._____ Total Potential Contaminant Source / Land Use Score - Zone 1B 16 16 18 12 Potential Contaminant / Land Use - ZONE II 2 2. Contaminant Sources Present 2. Sources of Class II or III leacheable contaminants or YES 1 1 1 Land Use Zone II Potential Contaminant Source / Land Use Score - Zone II 3 3 3 Potential Contaminant / Land Use - ZONE III YES 1 1 Contaminant Source Present YES 1 1 Sources of Class II or III leacheable contaminants or 1 NO 0 0 Is there irrigated agricultural lands that occupy > 50% of Total Potential Contaminant Source / Land Use Score - Zone III 2 2 2 Cumulative Potential Contaminant / Land Use Score 4. Final Susceptibility Source Score 5. Final Well Ranking High

Well# : WELL #5

06/29/2001 11:29:50 AM

5. Final Well Ranking

Public Water System Name :

Public Water System Number 7100004

1. System Construction Drill Date 03/01/1974 Driller Log Available YES Sanitary Survey (if yes, indicate date of last survey) 1995 YES Well meets IDWR construction standards 1 Wellhead and surface seal maintained YES Casing and annular seal extend to low permeability unit YES Highest production 100 feet below static water level YES Well located outside the 100 year flood plain Total System Construction Score 1 2. Hydrologic Sensitivity Soils are poorly to moderately drained YES Vadose zone composed of gravel, fractured rock or unknown 1 NO Depth to first water > 300 feet 1 Aquitard present with > 50 feet cumulative thickness Total Hydrologic Score 6 IOC SOC Microbial Score Score 3. Potential Contaminant / Land Use - ZONE 1A Score 2 2 2 2 2 0 2 Land Use Zone 1A IRRIGATED CROPLAND Farm chemical use high YES Farm chemical use high YES 2 0 2 icrobial sources in Zone 1A YES NO NO NO NO Total Potential Contaminant Source/Land Use Score - Zone 1A 4 2 4 IOC, VOC, SOC, or Microbial sources in Zone 1A 2 Potential Contaminant / Land Use - ZONE 1B Contaminant sources present (Number of Sources) 25 26 26 8 8 (Score = # Sources X 2) 8 Points Maximum 8 11 Sources of Class II or III leacheable contaminants or 9 YES 4 4 4 Points Maximum 4 Zone 1B contains or intercepts a Group 1 Area YES 0 0 4 2. 0 Land use Zone 1B Greater Than 50% Irrigated Agricultural Land ._____ Total Potential Contaminant Source / Land Use Score - Zone 1B 16 16 18 12 Potential Contaminant / Land Use - ZONE II Contaminant Sources Present 2 2. 2. Sources of Class II or III leacheable contaminants or YES 1 1 1 Land Use Zone II Potential Contaminant Source / Land Use Score - Zone II 3 3 3 Potential Contaminant / Land Use - ZONE III YES 1 1 Contaminant Source Present YES 1 1 Sources of Class II or III leacheable contaminants or 1 NO 0 0 Is there irrigated agricultural lands that occupy > 50% of Total Potential Contaminant Source / Land Use Score - Zone III 2 2 2 Cumulative Potential Contaminant / Land Use Score 4. Final Susceptibility Source Score

Well# : WELL #6

Moderate Moderate Moderate

06/29/2001 11:30:04 AM

Public Water System Name :

AMMON CITY OF

Public Water System Number 7100004

1. System Construction Drill Date 03/13/1978 Driller Log Available YES Sanitary Survey (if yes, indicate date of last survey) 1995 YES Well meets IDWR construction standards NO 1 Wellhead and surface seal maintained YES Casing and annular seal extend to low permeability unit NO Highest production 100 feet below static water level Well located outside the 100 year flood plain Total System Construction Score 4 Hydrologic Sensitivity Soils are poorly to moderately drained YES Vadose zone composed of gravel, fractured rock or unknown 1 Depth to first water > 300 feet NO 1 Aquitard present with > 50 feet cumulative thickness YES 0 Total Hydrologic Score 4 IOC SOC Microbial Score Score 3. Potential Contaminant / Land Use - ZONE 1A Score Land Use Zone 1A IRRIGATED CROPLAND 2 2 2 2 2 chemical use high YES 2 0 2 Farm chemical use high YES Farm chemical use high YES 2 0 2 icrobial sources in Zone 1A NO NO NO NO NO Total Potential Contaminant Source/Land Use Score - Zone 1A 4 2 4 IOC, VOC, SOC, or Microbial sources in Zone 1A Potential Contaminant / Land Use - ZONE 1B Contaminant sources present (Number of Sources) 20 22 9 8 8 (Score = # Sources X 2) 8 Points Maximum Sources of Class II or III leacheable contaminants or 10 YES 10 4 4 4 Points Maximum 4 Zone 1B contains or intercepts a Group 1 Area YES 0 0 4 4 2. Land use Zone 1B Greater Than 50% Irrigated Agricultural Land ._____ Total Potential Contaminant Source / Land Use Score - Zone 1B 16 16 18 12 Potential Contaminant / Land Use - ZONE II 2 2. Contaminant Sources Present 2. Sources of Class II or III leacheable contaminants or YES 1 1 1 Land Use Zone II Potential Contaminant Source / Land Use Score - Zone II 3 3 3 Potential Contaminant / Land Use - ZONE III YES 1 1 Contaminant Source Present YES 1 Sources of Class II or III leacheable contaminants or 1 1 NO 0 0 Is there irrigated agricultural lands that occupy > 50% of Total Potential Contaminant Source / Land Use Score - Zone III 2 2 2 Cumulative Potential Contaminant / Land Use Score 4. Final Susceptibility Source Score 5. Final Well Ranking High

Well# : WELL #7

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Public Water System Name :

AMMON CITY OF

Public Water System Number 7100004

1. System Construction		SCORE			
Drill Date	06/10/1996				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	NO	0			
Well meets IDWR construction standards	YES	0			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	3			
. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	6			
. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	 2	 2	2
Farm chemical use high	YES	2	0	2	2
IOC, VOC, SOC, or Microbial sources in Zone 1A		NO	NO	NO	NO
	NO ial Contaminant Source/Land Use Score - Zone 1A	4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	27	25	29	13
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	14	13	13	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potentia	l Contaminant Source / Land Use Score - Zone 1B	16	16	18	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	120	0	0	0	
Potential	Contaminant Source / Land Use Score - Zone II	3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	 1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential	Contaminant Source / Land Use Score - Zone III	2	2	2	0
Cumulative Potential Contaminant / Land Use Score		25	23	27	14
4. Final Susceptibility Source Score		14	14	14	14
5. Final Well Ranking		High	 High	High	High

Well# : WELL #8

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